

Remarks

1. Status of the Claims

Claims 1-4 and 6-8 are currently pending. Claims 1, 7 and 8 have been amended.

Claim 1 has been amended by including the limitation of applying *only* a repeated succession of a low-power state and a high-power state. Claim 1 has also been amended to include the limitation of maintaining the pressure of the plasma between 100 mbar and 350 mbar. Dependent claims 7 and 8 have been amended by removing the limitation now included in independent claim 1. No new matter has been added.

2. Response to Rejections

Claims 1-4 and 6-8 stand rejected under 35 U.S.C. § 103(a) as allegedly being obvious over U.S. Patent No. 5,626,922 (Miyanaga). While applicants respectfully disagree, they have nonetheless amended claim 1 to include additional limitations that further distinguish the claimed invention from Miyanaga.

First, claim 1 has been amended to include the limitation that the pressure of the plasma be maintained between 100 mbar and 350 mbar. This pressure range differs from the much lower pressure range taught in Miyanaga of about 0.04 mbar to 40 mbar.

Second, claim 1 has been amended to include the limitation that *only* a repeated succession of a low-power state and a high power state be applied. This limitation further distinguishes the claimed invention from Miyanaga which teaches a process which “takes advantage of the interaction between a magnetic field and an electric field.” (See Miyanaga column 1, lines 62-64 and column 3, lines 18-20.) For these reasons, further explained below, Miyanaga does not make the claimed invention obvious and Applicant submits that the claims as amended are in condition for allowance.

a. The Plasma Pressure Range of the Claimed Invention is Distinct From The Plasma Pressure Range Taught in Miyanaga

Claim 1 as amended includes the limitation that the pressure of the plasma is maintained between 100 mbar and 350 mbar. (*See* specification page 2, paragraph 0053 for support.) This limitation was previously included in claims 7 and 8. In rejecting claims 7 and 8, the Office asserted, “plasma pressures... are given within the claimed ranges in the examples.” (*See* Office action, page 5.) However, Applicant submits that the assertion that Miyanaga discloses plasma pressures within the claimed range of 100 mbar to 350 mbar is incorrect. Miyanaga discloses a process which takes place at pressures in the range of .03 torr to 30 torr and preferably from .3 torr to 3 torr. (*See* Miyanaga column 2, lines 46-47.) Further, Miyanaga insists on maintenance of pressure within this range by teaching “[b]y thus realizing the particular environment, the film deposition of a material which undergoes decomposition or reaction only at such high pressure becomes possible.” (*See* Miyanaga column 3, lines 1-10.) Miyanaga’s teaching is equivalent to a pressure of approximately 0.04 mbar to 40 mbar. Thus, the lowest pressure encompassed by the currently pending claims is more than twice the highest pressure taught by Miyanaga.

Because Miyanaga does not teach plasma pressures within the claimed ranges, as incorrectly asserted by the Office, the Office has not clearly articulated rationale supported by sound factual underpinnings as required by M.P.E.P. §§ 2142, 2143 as to why the claimed invention is obvious over Miyanaga. For at least this reason, Applicant submits that independent claim 1 is not obvious.

b. The Teaching of Miyanaga Requires the Use of an Additional Magnetic Field

Claim 1 as amended includes the limitation that *only* a repeated succession of a low-power state and a high-power state be applied. Applicant submits that the claimed invention cannot be obvious over Miyanaga as Miyanaga teaches the use of an additional magnetic field. In particular, Miyanaga teaches a process which “takes advantage of the interaction between a magnetic field and an electric field” and is generally directed to a process for depositing uniform films on an irregular surface *in the presence of a magnetic field*. (See Miyanaga column 1, lines 28-30 and column 1, line 52 – column 2, line 2.)

The presence of the magnetic field taught by Miyanaga is critical to the process as the process relies upon a resonance with the magnetic field. (See Miyanaga column 1, line 22 and column 2, lines 48-49.) Accordingly, Miyanaga teaches a transformation process that is driven by electrons discharged as a result of application of the magnetic field. (See *e.g.* Miyanaga column 5, lines 32-35, and lines 40-42.) To the contrary, in the claimed invention, the transformation process is driven by a gas temperature that allows “high concentrations of hydrogen atoms H and carbon-containing radicals and therefore a high deposition rate.” (See specification page 2, paragraph 0054 and page 3, paragraph 0055.) The specific conditions of the claimed process, including the pressure range discussed in section 3a of this response, enable the absorption of electromagnetic power from a single source and allow for the manufacture of a diamond film absent a magnetic field. (See *e.g.* specification page 3, paragraph 0055, “[t]hese conditions thus advantageously allow the concentration of carbon-containing radicals to be increased...”.) Simply, whereas the process taught by Miyanaga requires the additional magnetic field for manufacturing a diamond film, the claimed invention does not.

Because the means of achieving manufacture of a diamond film are distinct in the claimed invention and Miyanaga, and the use of a magnetic field is indispensable to the process taught by Miyanaga, a person with ordinary skill in the art would not be motivated to modify the process taught in Miyanaga to achieve the manufacture of a diamond film in the absence of a magnetic field as in the claimed invention. Therefore, Applicant submits that the claimed invention is not obvious over Miyanaga.

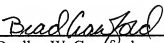
3. Conclusion

Applicant respectfully contends that all requirements of patentability have been met. Allowance of the claims and passage of the case to issue are therefore respectfully solicited.

The Examiner is urged to contact the Applicant's undersigned representative at (312) 913-2114 if the Examiner believes a discussion would expedite prosecution of this application.

Respectfully submitted,
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Dated: December 29, 2008

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